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Extent of Contamination Report
CONRAIL RAILYARD
New Bedford, Massachusetts

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I. INTRODUCTION

The Environmental Response Team was requested by Region 1 Enforcement personnel to perform an on-site investigation of the Conrail Railyard, New Bedford, Massachusetts to determine migration patterns of polychlorinated biphenyls (PCBs) spilled during off loading and transfer operations. The investigation involved sampling surface and subsurface soils, ground water and sediments from storm water catch basins and adjacent tidal ditches.

II. SITE DESCRIPTION

The Conrail railyard is located in the City of New Bedford on the west bank of the Acushnet River estuary. The site lies between Route 18 and Herman Melville Boulevard and is bordered on the north by active commercial businesses. Former employees indicate that spillage of PCB's frequently occurred in the northern portion of the site during the transfer of transformer oils from tank cars to drums or tank trucks. This area between the rail spurs is paved with cobblestones and is used for customer and employee parking by local businesses. Since public access to this contaminated area is unrestricted, it is often used by the local populace as a "short-cut" and pets also frequent this area.

The site is flat with an underlying soil of high permeability gravels and sands. There are several shallow depressions on-site in which rainwater ponds briefly prior to percolation into the groundwater. Ground water is shallow with a depth of three to four feet in the area of major spillage. A man-made culvert or swale forms the northern site boundary and discharges into a tidal ditch which empties into the Acushnet River. This culvert primarily diverts runoff from off-site areas directly to the river. There is no visible evidence indicating that surface water runoff from the site enters this culvert. Two other surface water diversion pipes pass beneath the site and discharge into their respective tidal ditches off-site.

III. SAMPLING LOCATIONS

Figure 1 is a map depicting the type and location of samples collected by the Environmental Response Team. The multi-media study conducted in January 1986 included samples of surface water, groundwater, soils and sediments. Specific ERT sampling locations were selected to determine the possible pathways that PCB's could have migrated from the site.

Data from two previous studies authorized by EPA Region I removal and remedial groups were reviewed to minimize any duplication of sampling efforts. ERT site reconnaissance located drainage ditches, storm water catch basins and outfalls which became the focal points of ERT's sampling effort.

Surface soil sampling locations were chosen to further define the lateral migration of PCB's from the spill areas. The surface sampling effort was expanded to determine if other PCB spills or broader migration of PCB's had occurred in other areas of the railyard.

Soil samples were collected up to four feet deep in known contaminated areas to evaluate the potential for vertical migration of PCB's through the soil strata. Shallow groundwater samples were also collected in potentially contaminated areas to evaluate the partitioning of PCB's between groundwater and soil.

A background surface sample was collected up-gradient and north of the site in a visibly non-contaminated area.

IV. COLLECTION METHODOLOGY

Surface water samples were collected by immersing two 1 liter laboratory cleaned sample bottles just below the surface, filling completely without any air space, capping with a Teflon lined cap and labeled. Separate water samples for salinity determination were collected in the tidal ditches.

Groundwater samples were collected by immersing laboratory cleaned sample bottles in hand dug pits or auger holes. One-liter sample bottles were then filled, labeled, and capped with Teflon lined caps.

All soil and sediment samples were placed in laboratory cleaned 12 oz jars using a clean stainless steel scoop. The jars were capped with Tefon lined caps and labeled. Hand augers were used to collect subsurface soil samples. The entire auger system was thoroughly scrubbed and washed with a methanol-water solution between sampling locations.

Field data sheets and chain of custody were maintained for all the samples. All samples were labeled with numbers from ERT field data sheets and transported in coolers with ice packs to maintain temperature at 4°C.

Water samples for oil and grease analysis were fixed with sulfuric acid to a pH of 2.

V. ANALYTICAL METHODOLOGY

Oil and Grease

Each water sample was poured into a graduated cylinder and the volume was recorded. The sample was then poured into a separatory funnel and extracted with Freon according to Method 502A of Standards Methods for the Examination of Water and Wastewater, 14th Edition (1975). The Freon extracts were analyzed using a Perkin-Elmer Model 283 Infrared Spectrometer with an detection limit of 10 ug/ml.

A stock solution containing 37.5% iso-octane, 37.5% hexadecane and 25% benzene was prepared and used as calibration standard. The samples were quantified by comparing the standard response (absorbance) of the 50.5 ppm standard to the sample response (absorbance) and adjusting for sample volume and dilution factors.

Soil samples were stirred thoroughly to attain homogeneity. Approximately 50 grams of each soil sample was air dried in a hood overnight. A ten gram portion was weighed into a 100 ml crimp top bottle and 100 ml of Freon added. The bottles were shaken for 20 minutes at 350 rpm, filtered and analyzed on the Perkin-Elmer Model 283 Infrared Spectrometer. The method detection limit was approximately 100 ug/g.

The concentration of oil and grease was calculated by comparing the sample response to a 50.5 ppm standard response.

Oil Fingerprinting

Oil fingerprinting was performed to determine if the oil and grease in the ground water was from the PCB laden oil percolating through the soil into the water below. Two groundwater samples and one oil/PCB contaminated soil were extracted for oil and grease then fingerprinted on the Gas Chromatograph.

Two of the tidal ditch surface water samples were extracted and fingerprinted along with a No. 2 fuel oil.

The extracts from the above samples were condensed and analyzed by flame-ionization detector-gas chromatography.

Polychlorinated biphenyls

Water samples were extracted in accordance with the methodology outlined in "Rapid Quantification of PCB's in Water by Gas Chromatographic Analysis" which involves spinning 500 ml of each sample with 20 ml of hexane for 30 minutes, then concentrating the extract to .5 ml using nitrogen while heating in a water bath at 50 degrees centigrade. Soil and sediment samples were extracted by shaking approximately 10 g of dried sample with 20 ml hexane for 30 minutes. A 400 ul portion of the extract was cleaned by injection onto a silica Sep-Pak and eluted with 4.6 ml hexane.

Sample extracts were analyzed using two Shimadzu GC-9A gas chromatographs utilizing the Ni^{63} ECD detector each equipped with a 6 meter Shimadzu column with 1.5% SP-2250/1.95% SP-2401 on 100/120 Supelcoport packing. Samples showing masking interferences were analyzed using a Supelco SPB-5 fused quartz capillary column, 30 meters X 0.25 mm ID on 0.25 um film. The method detection limit is approximately .025 ug PCB per liter for water and .05 ug/g for soils and sediments.

A five point calibration range from 25 to 500 ppb was prepared using Supelco Aroclor 1254 standard.

V. RESULTS

A summary of ERT's analytical results for all environmental media sampled is presented in Table 1. Complete analytical results, including results for specific PCB arochlors, are displayed in Table 2.

Results from previous studies conducted by Region I are included in reports attached in Appendix I. The results of these studies were incorporated into the contour maps which depict the extent of PCB contamination in the transfer area.

VI. DISCUSSION

Figure 2 shows the concentration of PCB's found by ERT to be present in surface soils and sediments throughout the railyard and in adjacent off-site areas. PCB concentrations dropped rapidly as the survey moved away from the highly contaminated area described above. A general background concentration of one to two parts per million was present in the majority of the railyard.

Residual levels of PCB's at the above levels are not uncommon in railyards. The relatively uniform concentrations of low-level PCB's found are indicative of contamination by windblown soil.

Slightly higher (2 - 2.8 ppm) concentrations of PCB's were found in sediments from the tidal ditches. The occurence of sediments with elevated concentrations of PCBs in the Acushnet River Estuary is well documented. Deposition of sediments, by tidal action, from highly contaminated areas upriver are the most likely source of PCB's present in the tidal ditches.

Highly Contaminated Areas

The northern part (location of reported spills) is contaminated more extensively than originally indicated by the NUS-FIT report. Combining results from the NUS-FIT report, Region 1 ESD report and ERT sampling effort, we generated an extent of surface soil contamination map using a computer model (CONTURᶠ) that performs smoothed contouring of data (Figure 3). The map produced indicates distinct hot spots in the area where PCBs were unloaded. Using results from a sampling effort conducted by Region 1 ESD in August 1985 and this study, we generated an extent of soil contamination map at the one foot depth level (Figure 4).

Although the one foot level depth hot spot is not directly associated with the surface contamination, it is proximal enough to be associated with the spill area. The composite depictions of data from all three studies conducted at conrail, indicate that spills occured over a broader

area than originally suspected. The major spillage was still confined to the northern portion of the site. Obviously some transfer areas had more spills than others.

Vertical Migration of PCB's

The level terrain of the Conrail site and the high permeability of site-soils led ERT's investigative team to believe that vertical transport of PCBs through the soils could be occuring. This would be particularly true in the spill areas, where the oil may have enhanced PCB transport through cosolubility. To investigate this possibility, ERT augered three holes through soils in the area of suspected contamination (Figure 1). Discrete soil samples were collected at the surface, at one, three, and four foot depths. Saturated soils were encountered between 3.5 - 4.0 feet below the grounds surface in this area.

None of the core stations showed any significant downward migration of PCB's, despite surface soil concentrations of 18.4, 41.9, and 7.5 ppm. However, as discussed below, close examination of groundwater and filterable suspended solids did reveal the presence of low level PCB contamination.

Groundwater

Soil auger holes were used to collect groundwater samples from three to four feet below the grounds surface. Groundwater samples collected from the unscreened auger holes contained significant amounts of suspended soil fines. In the laboratory, groundwater was filtered through a 20 to 25 micron retentive filter which removed the soil fines. Groundwater and soil fines were then extracted and analyzed for PCB.

Table 3A shows the concentrations of PCB's found in groundwater samples and associated filtered or unfiltered soil samples. While the bulk soil samples collected from auger buckets taken just below the water table did not show 50 ppb of PCB, the filtered soil fines and groundwater did have detectable PCB concentrations.

In this gravelly sand, the majority of the soil mass is in the larger soil grain sizes. Our results indicate that a much smaller fraction of the total weight of PCB's is in larger grass soil fraction. This tendency for PCB's to accumulate in fine suspended particulates was also noted in ERT's Acushnet River Tidal Study conducted at the Coggeshall Bridge in January 1983.

This phenomena is important when considering the transport of PCB's in the environment. Smaller particulates, which contain higher concentrations of PCB's, are more susceptible to movement by wind or surface water. In a gravelly sand such as the one present at Conrail, some movement of fines can also be expected vertically through the soil matrix with the percolation of rainwater.

PCBs dissolved in oils, or in lower concentrations in percolating water, may have moved through the overburden to groundwater table. The oils/PCBs affinity for soil fines resulted in elevated concentrations of PCB's in this soil fraction within the saturated zone. Non-detectable levels above this depth were more likely due to the particle size of samples analyzed than to actual differences in PCB concentration between layers.

Table 3A and 3B also show the distribution of PCB's between the groundwater and filtered soil fines. The median soil/groundwater distribution coefficient (Kd) for both data sets is 5182. On this basis, concentrations of PCB's in soil fines can be expected to be approximately 5000 times the PCB concentration found in the groundwater.

Due to the low solubility of PCB in water, only a very small concentrations (.03 - 1.64 ppb) of PCB have been detected in groundwater at the site. The rate of groundwater discharge to the Acushnet River has not been determined, hence total PCB loading from this source has not been calculated. However, given the existing levels of PCB present in the Acushnet River Estuary, any groundwater discharges to the River from this source would be expected to have minimal additional adverse impact on the aquatic ecosystem.

VII. RECOMMENDATIONS

The entire railyard is in a state of disrepair and abandonment. The perimeter is not secure. Trepassing is a common occurrence. While we were on-site, motor bikers were riding throughout the site. The northern area is freguented by workers and shoppers who park their cars on-site within 25 feet of the one of the more grossly contaminated spill areas.

Our experience with sites like Conrail, having high levels of PCBs, is that direct contact is the most likely route for humans to be exposed to the contaminated soils and vapors. Exposure is particularly crucial during the summer months when rising temperatures and dry conditions respectively enhance vaporization and air-borne particulate transport. If a removal is deemed appropriate, it should focus on the northern area where the highest levels of PCB's are found.

The data also indicate a strong association between the presence of PCBs and oil and grease. A regression analysis of the PCB versus the oil and grease levels in the spill area indicate a good positive correlation between these two parameters ($r = .89$, slope = 18.39, y intercept = -52.46). For future removal operations, oil and grease analyses may serve as a surrogate for PCB analyses in the northern area or other specific locations where oil and grease/PCB ratios can be derived. Oil and grease analyses are considerably more economical and can be performed quicker than PCBs.

REFERENCES

1. NUS FIT Team Draft Report 1985, Conrail Railyard Draft Site Investigation Report.

2. Tordoff, David W., 1985, Memorandum to file Conrail Railyard Report, U.S. EPA, Region I, Emergency Services Division.

3. Enviresponse Inc., 1986, Conrail Railyard Site Report, January 29,1986.

4. In-situ, Inc., 1984, Contur® In-situ Inc., Laramie, WY, 82070.

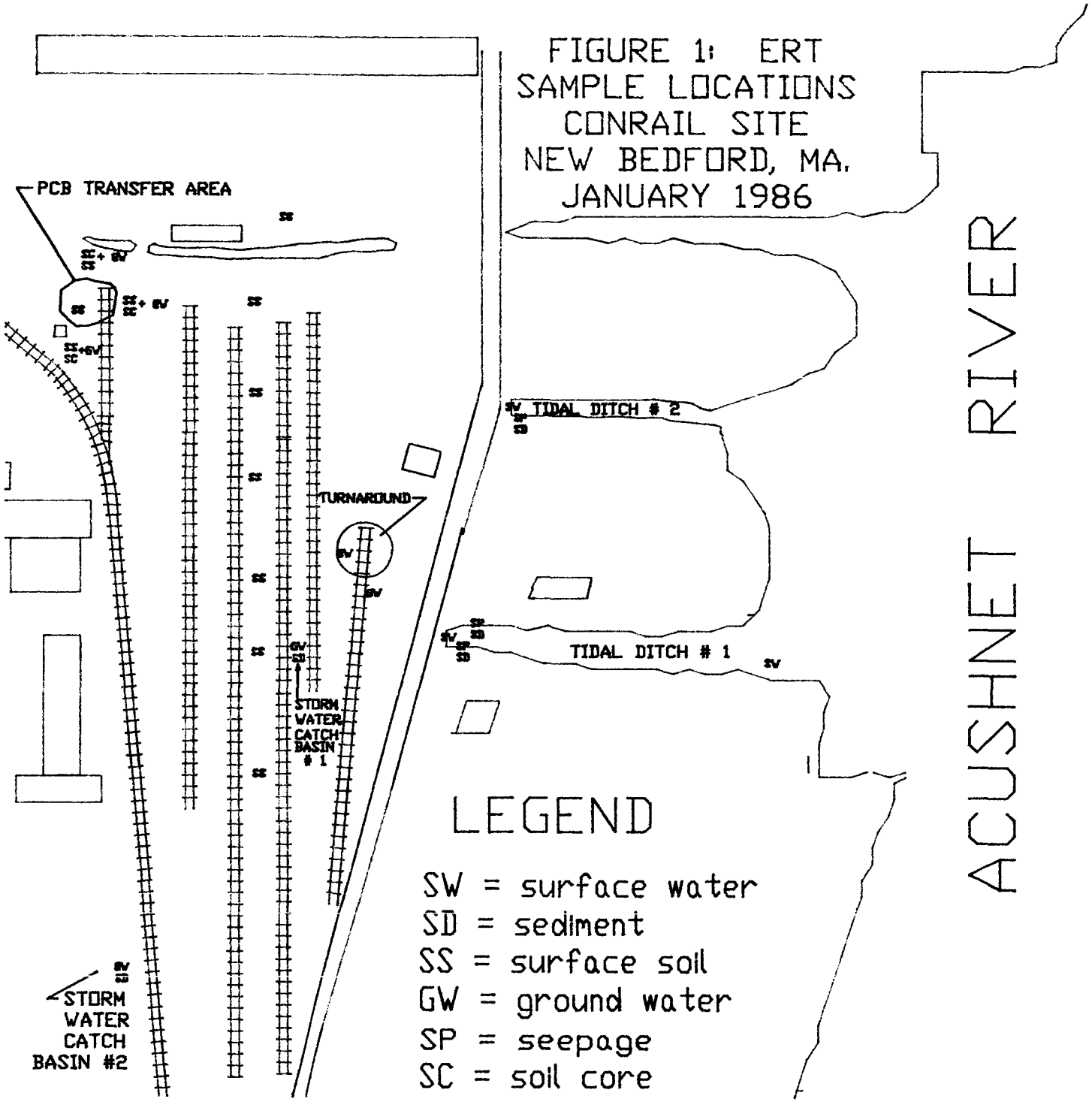
FIGURE 1: ERT
SAMPLE LOCATIONS
CONRAIL SITE
NEW BEDFORD, MA.
JANUARY 1986
PCB TRANSFER AREA
TURNAROUND
TIDAL DITCH # 2
TIDAL DITCH # 1
STORM WATER CATCH BASIN # 1
STORM WATER CATCH BASIN #2
ACUSHNET RIVER
LEGEND
SW = surface water
SD = sediment
SS = surface soil
GW = ground water
SP = seepage
SC = soil core

FIGURE 2: CONCENTRATION OF PCBs IN SURFACE SOILS COLLECTED BY ERT IN NEW BEDFORD, MASS., JANUARY 1986

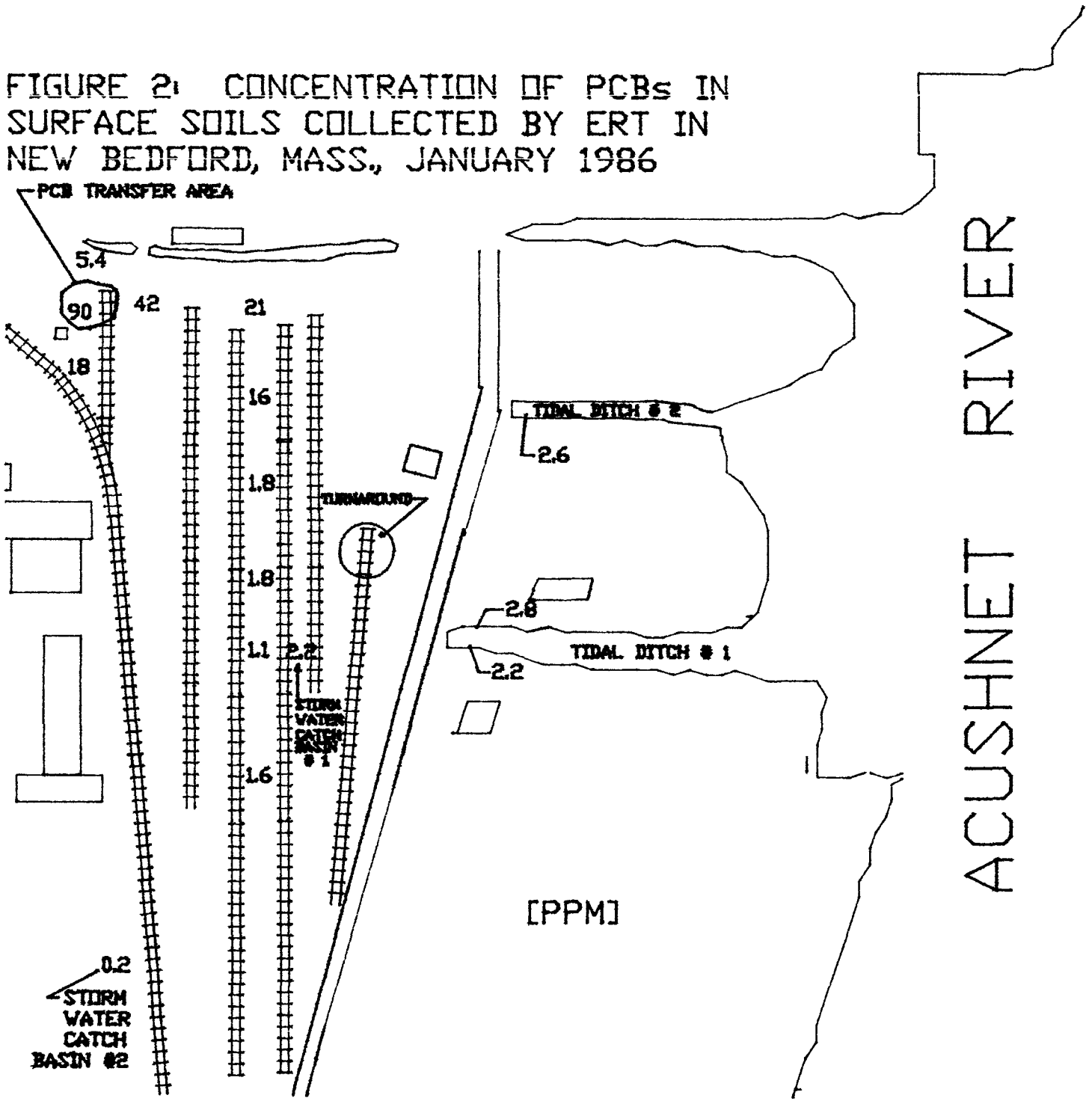

FIGURE 3: PCB SURFACE CONTOUR FOR THE CONRAIL RAILYARD TRANSFER AREA

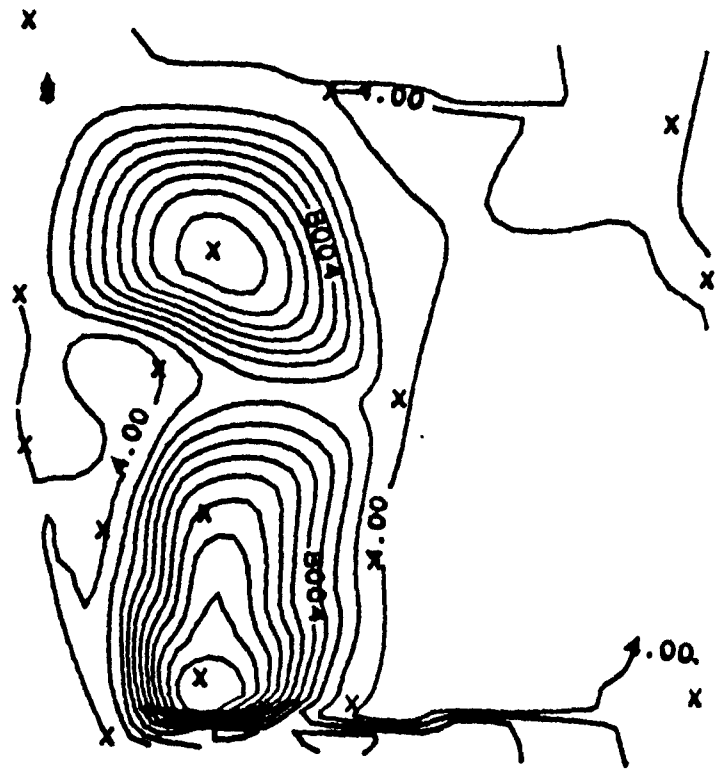

FIGURE 4: PCB'S AT THE ONE-FOOT DEPTH IN THE CONRAIL RAILYARD TRANSFER AREA

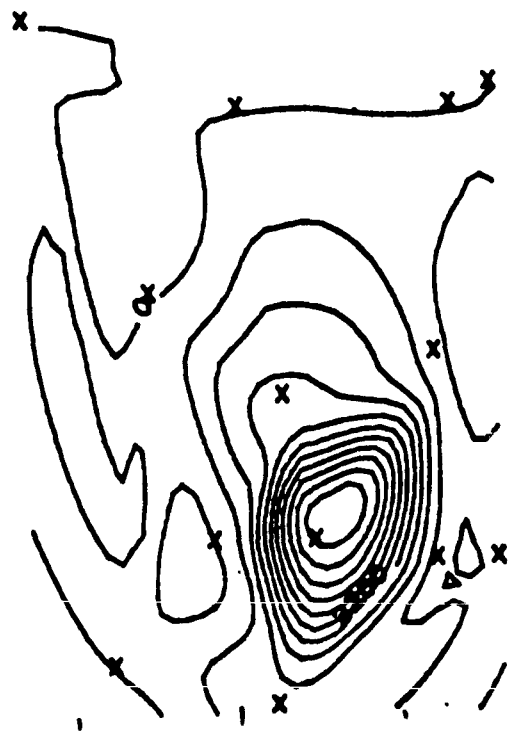

Table 1: Concentration of PCBs, Oil and Grease, and Salinity in soil, water and sediment samples collected at the Conrail Site, New Bedford, MA, by ERT in January 1986.

Area 1: PCB transfer area

Location 1: Area of obviously contaminated soil amongst piers

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5385	surface soil	90400	1904	N/A

Location 2: Near NUS SS01 - 85 ft south of fenced transformer building, south of transfer area.

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5373	surface soil	18390	132	N/A
5368	soil (8 in)	ND	< 100	N/A
5372	soil (3 ft)	ND	< 100	N/A
5374	soil (4.5 ft)	180	< 100	N/A
5375	groundwater (4.5 ft)	ND	< 3.6	N/A

Location 3: Near NUS SS02 - 20 ft east of transfer area beneath cobbles.

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5376	surface soil	41860	136	N/A
5377	soil (1 ft)	ND	< 100	N/A
5378	soil (3 ft)	ND	< 100	N/A
5383	water (3.25)	0.37	135	N/A
5383	* soil fraction	450	100	N/A
5386	soil (4.5 ft)	ND	< 100	N/A

PCB detection limit for water was 0.030 ppb and for soil was 50 ppb.
CAP - Results calculated from capillary column
N/A - Not applicable
ND - Not detected
* - Samples filtered through Whatman Filter No. 41 (20 - 25 micron

Table 1: Continued

Location 4: North of the transfer area and 15 ft south of the drainage ditch.

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5379	surface soil	5400	143	N/A
5379(CAP)	surface soil	7500	N/A	N/A
5380	soil (1 ft)	ND	< 100	N/A
5381	soil (3 ft)	ND	< 100	N/A
5384	water (3.5 ft)	1.451	145	N/A
5384	* soil fraction	2230	129	N/A
5382	soil (4 ft)	ND	< 100	N/A

Area 2: South - North transect between tracks east of transfer area

The southern most point is 100 yards south of catch basin number 1 while the northern most is 1040 ft north of catch basin number 1 with each sampling point seperated by approximately 200 ft.

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5357	stained surface soil	1620	156000	N/A
5359	surface soil	1090	172	N/A
5362	surface soil	1790	105	N/A
5369	surface soil	1880	102	N/A
5370	surface soil	15680	259	N/A
5371	surface soil	21050	206	N/A

PCB detection limit for water was 0.030 ppb and for soil was 50 ppb.
CAP - Results calculated from capillary column
N/A - Not applicable
ND - Not detected
* - Samples filtered through Whatman Filter No. 41 (20 - 25 micron retentive) and soil fraction also analyzed

Table 1: Continued

Area 3: Catch basins and manholes

Location 1: Catch basin number 1

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5351	soil (0.5 ft)	2170	14400.00	N/A
5352	soil (1 ft)	2180	12600.00	N/A
5352(CAP)		2100		
5353	groundwater (3.1 ft)	1.92	6.85	N/A
5353	* soil fraction	9950	20100	N/A

Location 2: Catch basin 2

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5355	groundwater (3.0 ft)	0.484	4.65	N/A
5355	* soil fraction	8120	N/A	N/A
5356	soil	190	378.00	N/A
5356(CAP)		110	N/A	N/A

Location 3: Rail car turn-around

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5366	ground water (5.2 ft)	0.117	< 1.00	N/A
5367	ground water (6.2 ft)	ND	< 1.00	N/A

PCB detection limit for water was 0.030 ppb and for soil was 50 ppb.
CAP - Results calculated from capillary column
N/A - Not applicable
ND - Not detected
* - Samples filtered through Whatman Filter No. 41 (20 - 25 micron retentive) and soil fraction also analyzed

Table 1: Continued

Area 4: Tidal ditches

Location 1: Southern most drainage culvert (# 1)

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5346	culvert discharge water	ND	34.2	4.00
5347	surface soil	2050	234	N/A
5348	surface soil	2200	604	20.45
5349	surface water	< 0.030	1.71	N/A
5350	seepage water	0.059	< 1.05	N/A
5350(CAP)	* soil fraction	6250	N/A	N/A
5358	seepage water	N/A	N/A	16.60
5360	culvert discharge water	N/A	N/A	4.00
5361	seepage water	N/A	N/A	23.49

Location 2: Central Tidal Ditch (# 2)

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5363	culvert discharge water	ND	27.80	N/A
5364	soil (0.5 ft)	2560	2390	N/A
5365	seepage water	1.64	3.20	N/A
5365(CAP)	* soil fraction	4750	N/A	N/A

Area 5: Background Sample upgradient and north of site

Sample Number	Sample Parameters	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5387	surface soil	380	201	N/A

PCB detection limit for water was 0.030 ppb and for soil was 50 ppb.
CAP - Results calculated from capillary column
N/A - Not applicable
ND - Not detected
* - Samples filtered through Whatman Filter No. 41 (20 - 25 micron retentive) and soil fraction also analyzed

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Table 2: Total PCBs and individual Aroclor concentrations, Oil and Grease, and Salinity in soil, water and sediment samples collected at the Conrail Site, New Bedford, MA, by ERT in January 1986.

Area 1: PCB transfer area

Location 1: Area of obviously contaminated soil amongst piers

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5385	surface soil	ND	79900	10500	90400	1904	N/A

Location 2: Near NUS SS01 - 85 ft south of fenced transformer building, south of transfer area.

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5373	surface soil	14500	3810	880	18390	132	N/A
5368	soil (8 in)	ND	ND	ND	ND	< 100	N/A
5372	soil (3 ft)	ND	ND	ND	ND	< 100	N/A
5374	soil (4.5 ft)	ND	100	ND	100	< 100	N/A
5375	groundwater (4.5 ft)	ND	ND	ND	ND	< 3.6	N/A

Location 3: Near NUS SS02 - 20 ft east of transfer area beneath cobbles

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5376	surface soil	14900	23300	3660	41860	136	N/A
5377	soil (1 ft)	ND	ND	ND	ND	< 100	N/A
5378	soil (3 ft)	ND	ND	ND	ND	< 100	N/A
5383	water (3.25 ft)	ND	0.33	0.04	0.37	135	N/A
5383	* soil fraction	ND	450	ND	450	100	N/A
5386	soil (4.5 ft)	ND	ND	ND	ND	< 100	N/A

PCB detection limit for water was 0.030 ppb and for soil was 50 ppb.
CAP - Results calculated from capillary column
N/A - Not applicable
ND - Not detected
* Sample filtered through Whatman Filter No. 41 (20 - 25 micron retentive) and soil fraction also analyzed

Table 2: Continued

Location 4: North of the transfer area and 15 ft south of the drainage ditch

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5379	surface soil	2450	2390	560	5400	143	N/A
5379(CAP)	surface soil	3040	2690	970	7500	N/A	N/A
5380	soil (1 ft)	ND	ND	ND	ND	< 100	N/A
5381	soil (3 ft)	ND	ND	ND	ND	< 100	N/A
5384	water (3.5 ft)	0.92	0.44	0.091	1.451	145	N/A
5384	* soil fraction	1390	710	130	2230	129	N/A
5382	soil (4 ft)	ND	ND	ND	ND	< 100	N/A

Area 2: South - North transect between tracks east of transfer area

The southern most point is 100 yards south of catch basin number 1 while the northern most is 1040 ft north of catch basin number 1 with each sampling point seperated by approximately 200 ft.

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5357	stained surface soil	ND	1300	240	1620	156000	N/A
5359	surface soil	ND	850	240	1090	172	N/A
5362	surface soil	890	650	250	1790	105	N/A
5369	surface soil	1360	380	140	1880	102	N/A
5370	surface soil	11300	3260	1120	15680	259	N/A
5371	surface soil	10700	7890	2460	21050	206	N/A

PCB detection limit for water was 0.030 ppb and for soil was 50 ppb.
CAP - Results calculated from capillary column
N/A - Not applicable
ND - Not detected
* Sample filtered through Whatman Filter No. 41 (20 - 25 micron retentive) and soil fraction also analyzed

Table 2: Continued

Area 3: Catch basins and manholes

Location 1: Catch basin number 1

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5351	soil (0.5 ft)	ND	1670	500	2170	14400.00	N/A
5352	soil (1 ft)	ND	1900	280	2180	12500.00	N/A
5352(CAP)		ND	1760	340	2100		
5353	groundwater (3.1 ft)	ND	1.45	0.47	1.92	6.05	N/A
5353	* soil fraction	ND	7930	2020	9950	20100	N/A

Location 2: Catch basin 2

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5355	groundwater (3.0 ft)	ND	0.38	0.104	0.484	4.65	N/A
5355	* soil fraction	ND	6100	2020	8120	N/A	N/A
5356	soil	ND	190	ND	190	378.00	N/A
5356(CAP)		ND	110	ND	110	N/A	N/A

Location 3: Rail car turn-around

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5366	ground water (5.2 ft)	ND	0.085	0.032	0.117	< 1.00	N/A
5367	ground water (6.2 ft)	ND	ND	ND	< 0.030	< 1.00	N/A

PCB detection limit for water was 0.030 ppb and for soil was 50 ppb.
CAP - Results calculated from capillary column
N/A - Not applicable
ND - Not detected
* Sample filtered through Whatman Filter No. 41 (20 - 25 micron retentive) and soil fraction also analyzed

Table 2: Continued

Area 4: Tidal ditches

Location 1: Southern most drainage culvert (# 1)

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5346	culvert discharge water	ND	ND	ND	ND	34.2	4.00
5347	surface soil	2340	510	ND	2850	234	N/A
5348	surface soil	1800	320	ND	2200	604	20.45
5349	surface water	ND	(0.030	ND	(0.030	1.71	N/A
5350	seepage	ND	0.059	ND	0.059	(1.05	N/A
5350(CAP)	* soil fraction	3200	2300	670	6250	N/A	N/A
5358	seepage	N/A	N/A	N/A	N/A	N/A	16.60
5360	culvert discharge water	N/A	N/A	N/A	N/A	N/A	4.00
5361	seepage	N/A	N/A	N/A	N/A	N/A	23.49

Location 2: Central Tidal Ditch (# 2)

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5363	culvert discharge water	ND	ND	ND	ND	27.80	N/A
5364	soil (0.5 ft)	2030	430	100	2560	2390	N/A
5365	seepage	ND	1.35	0.29	1.64	3.20	N/A
5365(CAP)	* soil fraction	3460	1020	270	4750	N/A	N/A

Area 5: Background Sample upgradient and north of site

Sample Number	Sample Parameters	PCB concentration in ppb of the following Aroclor 1248	Aroclor 1254	Aroclor 1260	Total	Conc. of Oil & Grease (ppm)	Salinity (parts per thousand)
5387	surface soil	ND	330	50	380	201	N/A

PCB detection limit for water was 0.030 ppb and for soil was 50 ppb.
CAP - Results calculated from capillary column
N/A - Not applicable
ND - Not detected
* Sample filtered through Whatman Filter No. 41 (20 - 25 micron retentive) and soil fraction also analyzed

TABLE 3: DISTRIBUTION OF PCB'S (Kd) BETWEEN GROUNDWATER AND ASSOCIATED SOIL SAMPLES.
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A. ALL DATA (INCLUDING WATER SEEPAGE IN TIDAL DITCHES).

SMP.#	DESCRIPT	[PCB] SOIL ug/Kg	[PCB] GRDWTR ug/l	DISTRIB. COEFFICIENT Kd
5374	SOIL FRAC	180	0.03	6000
5383	SOIL FRAC	450	0.37	1216
5386	SAT. SOIL	< 50		
5384	SOIL FRAC	2230	1.45	1538
5382	SAT. SOIL	< 50		
5353	SOIL FRAC	9950	1.92	5182
5352	SAT. SOIL	2180		
5355	SOIL FRAC	8120	0.48	16917
5356	SAT. SOIL	190		
5350	SEEPAGE	6250	0.06	104167
5365	SEEPAGE	4750	1.64	2896
			Median	5182
			Average	19702
			Std. Dev.	34836

B. SOIL FRACTION/GROUNDWATER PCB DISTRIBUTION EXCLUDING SEEPAGE WATER AND SATURATED SOILS DATA.

SMP.#	DESCRIPT	[PCB] SOIL ug/Kg	[PCB] GRDWTR ug/l	DISTRIB. COEFFICIENT Kd
5374	SOIL FRAC	180	0.03	6000
5383	SOIL FRAC	450	0.37	1216
5384	SOIL FRAC	2230	1.45	1538
5382	SAT. SOIL	< 50		
5353	SOIL FRAC	9950	1.92	5182
5352	SAT. SOIL	2180		
5355	SOIL FRAC	8120	0.48	16917
5356	SAT. SOIL	190		
			Median	5182
			Average	6171
			Std. Dev.	5701